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UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/788,589	02/27/2004	Ronald S. Karr	VRT0120US	6846

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ART UNIT	PAPER NUMBER
2185	

DATE MAILED: 05/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *27 February 2004*.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-26* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-26* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on *27 February 2004* is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____ .

DETAILED ACTION

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by
> another filed in the United States before the invention by the applicant for patent or (2) a patent
> granted on an application for patent by another filed in the United States before the invention by the
> applicant for patent, except that an international application filed under the treaty defined in section
> 351(a) shall have the effects for purposes of this subsection of an application filed in the United States
> only if the international application designated the United States and was published under Article 21(2)
> of such treaty in the English language.

2.   Claims 1-6, 13, 16-21, 24 and 26 are rejected under 35 U.S.C. 102(e) as being

anticipated by Satran et al (US Patent No. 6,668,304).

For claim 1, Satran discloses a method comprising:

a computer system generating first and second write transactions (an improved

system for supporting data transactions, col. 2, lines 61-63);

wherein the first and second write transactions comprise first and second tags,

respectively, wherein each of the first and second tags relate the first write transaction

to the second write transaction (tags indicate which of the data blocks is currently

engaged in an open data transaction, col. 5, lines 10-11; one or more data fields include

a tag indicative of a state of the data transaction, col. 5, lines 66-67; the data transaction

comprises a plurality of concurrent data transactions, col. 6, lines 7-8);

the computer system transmitting the first and second write transactions to first and second storage devices, respectively (one or more storage devices are used for storing data contents of transactions, col. 3, lines 1-3).

Claim 2 is rejected using the same rationale as for the rejection of claim 1 above.

For claim 3, Satran discloses the first write transaction comprises data D to be written to a logical block of a first storage object (a translation table which maps logical block addresses of the succession of data blocks to respective physical addresses and which tags which of the data blocks is currently engaged in an open data transaction, col. 5, lines 8-11);

the second write transaction comprises data D to be written to a logical block of a second storage object (col. 5, lines 8-11).

For claim 4, the first storage device receiving the first write transaction;

the first storage device storing in an entry of a first tag table, the first tag and an identity of the logical block where data D is to be written, wherein the first tag table is stored in first memory (storing the one or more data structures includes storing an auxiliary translation table which for each respective open data transaction, maps logical block addresses associated with an open transaction to respective physical addresses of the succession of data blocks existing prior to initiation of the data transaction and to an identity of the open data transaction, col. 6, lines 54-58);

the second storage device receiving the second write transaction;

the second storage device storing in an entry of a second tag table, the second

tag and an identity of the logical block where data D is to be written, wherein the second

tag table is stored in second memory (col. 6, lines 54-58).

Claim 5 is rejected using the same rationale as for the rejection of claim 3 above.

Claim 6 is rejected using the same rationale as for the rejection of claim 4 above.

For claim 13, Satran discloses the invention as per rejection of claim 1 above.

Satran further discloses the first write transaction comprises data D to be written

to an extension of a first storage object (performing a recovery operation includes

determining a state of an open transaction to query the state and decide whether to

commit or abort the open transaction, col. 8, lines 11-14);

the second write transaction comprises data D to be written to an extension of a second

storage object (col. 8, lines 11-14).

Claim 16 is rejected using the same rationale as for the rejection of claim 1

above.

For claim 17, Satran discloses the invention as per rejection of claim 1 above.

Satran further discloses a computer readable medium storing instructions

executable by a computer system, wherein the computer system implements a method

in response to executing the instructions (a computer software product for performing a

data transaction, including a computer-readable medium having program instructions

recorded therein, with instructions to be read by a computer, col. 9, lines 4-26).

Claim 18 is rejected using the same rationale as for the rejection of claim 17

above.

Claim 19 is rejected is rejected using the same rationale as for the rejections of claims 3 and 17 above.

Claim 20 is rejected using the same rationale as for the rejections of claims 5 and 17 above.

Claim 21 is rejected using the same rationale as for the rejection of claim 17 above.

Claim 24 is rejected using the same rationale as for the rejections of claims 13 and 17 above.

Claim 26 is rejected using the same rationale as for the rejections of claims 4 and 17 above.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4.   Claims 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Satran et al (US Patent No. 6,668,304) and Gaither et al (US PGPub No. 20040098544).

For claim 7, Satran discloses the invention as per rejection of claim 4 above.

Satran fails to disclose the limitations of claim 7.

Gaither, however, discloses comparing the contents of one entry in the first tag table with the contents of entries in the second tag table to determine whether the second tag table includes an entry that matches the one entry (a virtual compression system may be configured to identify units of memory that share identical content among a plurality of partitions, par. 0031; a copy counter may be associated with each entry in a page partition table, and when a new identical page has been determined, the copy counter may be incremented for each entry that references the matching page across the partitions, par. 0032).

(a method includes searching a data structure for a candidate page having identical content to a requesting page in a memory system, where a check value of the requested page is used to search the data structure, par. 0004).

Satran and Gaither are analogous art in that they are of the same field of endeavor, that is, a system and/or method of memory management. It would have been obvious to a person of ordinary skill in the art at the time of the invention to include comparing entries for a match in content because otherwise, many of the mass storage partitions may contain duplicate information (par. 0003), and updating respective partition page tables that reference matching pages accordingly may optimize memory systems across partitions (par. 0025), as taught by Gaither.

For claim 8, the combined teachings of Satran and Gaither disclose the invention as per rejection of claim 7 above.

Gaither further discloses copying data, associated with the logical block number identified by the one entry, from the first storage object to the logical block in the second

storage object if the second table lacks an entry with contents matching the contents of

the one entry (the controller may copy the contents of the matching page to the

requested page and forward the requested data to the memory system to perform the

write operation, par. 0060).

For claim 9, the combined teachings of Satran and Gaither disclose the invention

as per rejection of claim 8 above.

Gaither further discloses deleting the one entry in the first table if the second

table contains an entry with contents that match the contents of the one entry (any

mapping to duplicate pages is removed and the duplicate pages are returned to a free

page pool, which is maintained by the virtual compression system, par. 0019).

Claim 10 is rejected using the same rationale as for the rejection of claim 9

above.

5.   Claims 11-12, 14-15, 22-23 and 25 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Satran et al (US Patent No. 6,668,304) and Mattis et al (US Patent

No. 6,128,627).

For claim 11, Satran discloses the invention as per rejection of claim 1 above.

Satran fails to disclose the limitations of claim 11.

Mattis, however, discloses the computer system generating a write transaction to

write data to a logical block of a data volume;

the computer system incrementing a counter in response to generating the write

transaction (if a matching block is not currently in the process of being created or

destroyed, then the block can be used, and the process increments a write counter, which is an internal variable, stored in association with the block, that indicates the number of processor or programmatic objects that are writing the block, col. 34, lines 52-58);

the computer system generating the first and second tags, wherein each of the first and second tags relate to the first and second write transactions, respectively, wherein the first and second tags are generated in response to generation of the write transaction, and wherein the first and second tags are generated as a function of an output of the incremented counter.

Satran and Mattis are analogous art in that they are of the same field of endeavor, that is, a system and/or method of memory management. It would have been obvious to a person of ordinary skill in the art at the time of the invention to include a write counter because this would indicate the number of processor or programmatic objects that are writing the block (col. 34, lines 56-58).

For claim 12, the combined teachings of Satran and Mattis disclose the invention as per rejection of claim 11 above.

Mattis further discloses the first and second storage devices comprise first and second object storage devices (a cache of information objects comprising a directory table that indexes each of the information objects in one of a plurality of buckets, col. 5, lines 66-67, col. 6, lines 1-2).

Claim 14 is rejected using the same rationale as for the rejections of claims 1 and 12-13 above.

Claim 15 is rejected using the same rationale as for the rejection of claim 14 above.

Claim 22 is rejected using the same rationale as for the rejections of claims 11 and 18 above.

Claim 23 is rejected using the same rationale as for the rejections of claims 12 and 17 above.

Claim 25 is rejected using the same rationale as for the rejections of claims 15 and 17 above.

Citation of Pertinent Prior Art

6.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Dang et al (US Patent No. 6,606,682) discloses sequentially-ordered memory clusters for caching disk data stored in sectors, which are identified by logical block addresses. There is included a cache control system, a tag memory comprising tag records assigned to segments of continuous ranges of logical block addresses.

Contact Information

7.   Any inquiries concerning this action or earlier actions from the examiner should be directed to Daniel Kim, reachable at 571-272-2742, on Mon-Fri from 8:30am-5pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mano Padmanabhan, is also reachable at 571-272-4210.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information from

published applications may be obtained from either Private PAIR or Public PAIR. Status

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more information about the PAIR system, see http://pair-direct.uspto.gov. All questions

regarding access to the Private PAIR system should be directed to the Electronic

Business Center (EBC), reachable at 866-217-9197.

4-26-06

PIERRE VITA L
PRIMARY EXAMi:.